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EMI shielding effectiveness of polypropylene/poly(lactic acid)/carbon fiber/MWCNT composites prepared by injection molding and screw extrusion

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The electrical conductivity and electromagnetic interference (EMI) shielding effectiveness of the composites of polypropylene/poly(lactic acid) (PP/PLA) (70/30, wt%) with single filler of multiwall carbon nanotube (CNT) or hybrid fillers of nickel-coated carbon fiber (CF) and CNT were investigated. For the single filler composite, higher electrical conductivity was observed when the PP-g-maleic anhydride was added as a compatibilizer between the PP and PLA. For the composite of the PP/PLA (70/30)/CF (20 phr)/CNT (5 phr), the composite prepared by injection molding observed a higher EMI shielding effectiveness than the composite prepared by screw extrusion. The higher values in EMI shielding effectiveness and electrical conductivity of the PP/PLA/CF (20 phr)/CNT (5 phr) composite seemed mainly because of the increased CF length when the composites were prepared using injection molding machine, compared with the composites prepared by screw extrusion. This result suggests that the fiber length of the conductive filler is an important factor in obtaining higher values of electrical conductivity and EMI shielding effectiveness of the PP/PLA/CF/CNT composites.

Biography

Myung Geun Jang has been studying PhD course in Department of Chemical and Biological Engineering at Korea University. His expertise is focused in the field of mechanical and electrical properties of polymer/conductive filler composites. He has been using universal testing machine (UTM), advanced rheological expansion system (ARES) and scanning electron microscope (SEM) to investigate the properties of the composite. He studied the electromagnetic shielding materials and light-weight thermoplastic composite which were prepared by pultrusion, injection molding and extrusion process. He also studied the rigid polyurethane foams which are used as insulation materials.

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